

Application No: 10/797,455

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REMARKS

Claims 1-31 are pending in the application. The specification has been objected to for informalities and failing to provide antecedent basis for certain claim limitations. Claim 1 has been objected to for informalities. Claims 6, 9, 15, 16, 20, and 21 are rejected under 35 USC 102 as being anticipated by Dalla Betta et al (US 5,183,401). Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Dalla Betta et al in view of Karrs(US 2003/0072693 A1). Claims 8, 22, and 23 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Dalla Betta et al in view of Spadaccini et al (US 5,207,053). Claims 10 and 12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Dalla Betta et al in view of Fay, III et al (US 6,040,266). Claim 11 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Dalla Betta et al in view of Yoshizaki (US 5,800,789). Claims 13-16 and 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Dalla Betta et al in view of Fay, III et al, in further view of Lynwood et al (US 5,228,847).Claims 17 and 19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Dalla Betta et al in view of Huttonhofer et al (US 5,820,832). Claims 1, 3, and 5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Dalla Betta et al in view of Fay, III et al in further view of Lynwood et al. Claim 2 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Dalla Betta et al in view of Fay, III et al, in further view of Lynwood et al, in further view of Spadaccini et al. Claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Dalla Betta in view of Fay, III et al, in further view of Lynwood et al, in further view of Kato (US 5,439,651). Claims 24-31 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Lynwood et al in view of Fay, III et al. Claim 28 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Lynwood et al in view of Fay, III et al, in further view of Kato.

Claims 7, 13, 17, and 23 have been cancelled herein.

Specification Objections

Paragraph [0024] of the present published patent application has been amended as suggested in the Office Action. With regard the specification being objected to for failing to provide antecedent basis for the limitations of a "rich

Application No: 10/797,455

"catalytic stage" as recited in claim 22, Applicants respectfully submit that this limitation can be found in at least paragraphs [0002] and [0003] of the present published application. With regard the specification being objected to for failing to provide antecedent basis for the limitation of a "lean catalytic stage" as recited in claim 23, Applicants have canceled claim 23. Accordingly, the objections to the specification should be withdrawn.

Claim Objections

Claim 1 has been amended to correct for informalities. Accordingly, the objection to claim 1 should be withdrawn.

35 USC 102 Rejections

MPEP §2131 provides that a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. The identical invention must be shown in as complete detail as contained in the claim. The elements must be arranged as required by the claim.

Claim 1, as amended, includes the limitations of "a transition stage disposed between the first catalytic stage and the second catalytic stage, the transition stage comprising a narrowed flow area region disposed between an inlet end receiving the partially oxidized fuel/oxidizer mixture from the first catalytic stage and an outlet end discharging the partially oxidized fuel/oxidizer mixture into the second catalytic stage." Nowhere does Dalla Betta teach or suggest this limitation. Consequently, the rejection under 35 USC 102 should be withdrawn.

Rejected claims 2-5 depend from claim 1. The applicants respectfully submit that these claims are allowable along with, and for the same reasons, as independent claim 1, and further that these claims reference other patentably distinguishable features of the present invention. Accordingly, claims 2-5 are believed to be in condition for allowance.

35 USC 103 Rejections

Claim 6, as amended, includes the limitations of a "second catalytic stage further comprises a plurality of separate catalytic elements disposed along a flow

Application No: 10/797,455

axis of the combustor, each of the plurality of separate catalytic elements comprising an identical cross-section and being angularly rotated about the flow axis with respect to an adjacent catalytic element effective to cause mixing of a flow about the flow axis" and "a transition stage disposed between the first catalytic stage and the second catalytic stage, the transition stage comprising a narrowed flow area region disposed between an inlet end receiving the partially oxidized fuel/oxidizer mixture from the first catalytic stage and an outlet end discharging the partially oxidized fuel/oxidizer mixture into the second catalytic stage." None of the cited prior art, alone or in combination, teaches or suggests these limitations.

With regard to "a plurality of separate catalytic elements...being angularly rotated about the flow axis with respect to an adjacent catalytic element," the Office Action states that this limitation is obvious in view of the combination of Dalla Betta and Hutterhofer. Dalla Betta, merely describing a two stage catalytic combustor, fails to teach or suggest a catalytic stage having "separate catalytic elements ...being angularly rotated about the flow axis." See for Example, Dalla Betta, column 1, lines 6-10. Hutterhofer et al, however, fails to remedy the deficiencies of Dalla Betta with regard to this limitation as described in more detail in the following paragraph.

In contrast to the present invention, Hutterhofer et al describes a single stacked plate type catalytic element wherein the plates extend in a main flow direction. At least one of the plates includes a corrugated structure oriented obliquely relative to a main flow direction for deflecting the main flow through the element. See, for example, Hutterhofer et al, FIG. 1 and column 2, lines 40-50. This is different than a plurality of catalytic elements angularly rotated about a flow axis with respect to one another. Significantly, nowhere does Hutterhofer et al teach or suggest using a plurality of the stacked plate type catalytic elements or angularly rotating an element with respect to another element. Consequently, the combination of Dalla Betta and Hutterhofer et al fails to teach or suggest the limitation of "separate catalytic elements...being angularly rotated about the flow axis."

With regard to "a transition stage disposed between the first catalytic stage and the second catalytic stage, the transition stage comprising a narrowed flow area region," the Office Action states that this limitation is obvious in view of the

Application No: 10/797,455

combination of Dalla Betta and Karrs et al. Dalla Betta, merely describing a two stage catalytic combustor, fails to teach or suggest a transition stage between the catalytic stages. Karrs et al however, fails to remedy the deficiencies of Dalla Betta with regard to this limitation as described in more detail in the following paragraph.

In contrast to the present invention, Karrs et al describes a transition section 300 disposed between a gas flow modification section 200 and gas phase reactor section 400 having a catalyst bed 410. See for example Karrs et al, FIG. 1, and paragraphs [0038 and [0039]. The transition section 300 of Karrs et al includes a relatively small cross section inlet continuously expanding to a relatively large cross section outlet. Nowhere does Karrs et al describe a "a transition stage disposed between the first catalytic stage and the second catalytic stage, the transition stage comprising a narrowed flow area region." Consequently, the combination of Dalla Betta and Karrs et al fails to teach or suggest this limitation. For all the above reasons, none of the cited prior art, neither alone nor in combination, teaches or suggests the limitations recited in amended claim 6. Therefore, the rejection of claim 6 under 35 USC 103 should be withdrawn.

Rejected claims 8-12, 14-16, and 18-22 depend from claim 6. The applicants respectfully submit that these claims are allowable along with, and for the same reasons, as independent claim 6, and further that these claims reference other patentably distinguishable features of the present invention. Accordingly, claims 8-12, 14-16, and 18-22 are believed to be in condition for allowance.

Claim 24, as amended, includes the limitations of a "a transition pressure boundary disposed between the upstream pressure boundary and the downstream pressure boundary, the transition pressure boundary comprising a narrowed flow area region effective to generate a venturi effect disposed between an inlet end receiving the oxidized fuel/oxidizer mixture from the upstream pressure boundary and an outlet end discharging the partially oxidized fuel/oxidizer mixture into the downstream pressure boundary." None of the cited prior art, alone or in combination, teaches or suggests these limitations.

With regard to "a transition pressure boundary disposed between the upstream pressure boundary and the downstream pressure boundary" the Office Action states that this limitation is obvious in view of the combination of Dalla Betta

Application No: 10/797,455

and Karrs et al. Dalla Betta, merely describing a two stage catalytic combustor, fails to teach or suggest a transition pressure boundary between catalytic stages. Karrs et al, however, fails to remedy the deficiencies of Dalla Betta with regard to this limitation as described in more detail in the following paragraph.

In contrast to the present invention, Karrs et al describes a transition section 300 disposed between a gas flow modification section 200 and gas phase reactor section 400 having a catalyst bed 410. The transition section 300 of Karrs et al includes a relatively small cross section inlet continuously expanding to a relatively large cross section outlet used to decelerate a gas flowing therethrough. See, for example, Karrs et al, paragraph [0039]. Nowhere does Karrs et al describe a "transition pressure boundary comprising a narrowed flow area region effective to generate a venturi effect." Moreover, Karrs teaches the direct opposite of a venturi effect by describing a transition section for decelerating a gas flowing therethrough. Consequently, the combination of Dalla Betta and Karrs et al fails to render the limitations of a "transition stage comprising a narrowed flow area region effective to generate a venturi effect" obvious under 35 USC 103. For all the above reasons, none of the cited prior art, neither alone nor in combination, teaches or suggests the limitations recited in amended claim 24. Therefore, the rejection of claim 24 under 35 USC 103 should be withdrawn

Rejected claims 25-31 depend from claim 24. The applicants respectfully submit that these claims are allowable along with, and for the same reasons, as independent claim 24, and further that these claims reference other patentably distinguishable features of the present invention. Accordingly, claims 25-31 are believed to be in condition for allowance.

New claim 32 has been added herein. Support for this claim may be found in at least paragraph [0019] of the present published patent application. This claim is believed to be in allowable condition as it is patentably distinct from the cited references.

New claim 33 has been added herein. Support for this claim may be found in at least paragraph [0019] of the present published patent application. This claim is believed to be in allowable condition as it is patentably distinct from the cited references.

Application No: 10/797,455

Reconsideration of the amended application in light of the above Remarks and allowance of claims 1-6, 8-12, 14-16, 18-22 and 24-33 are respectfully requested.

Respectfully submitted,


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